AMENDMENTS TO THE CLAIMS

Please **CANCEL** claims 1-7 and 12-13 without prejudice or disclaimer to the subject matter therein.

Please **AMEND** claims 8-11 as shown below.

Please **ADD** claims 14-28 as shown below.

The following is a complete list of all claims in this application.

What is claimed is:

1. (Cancelled)

2. (Cancelled)

3. (Cancelled)

4. (Cancelled)

5. (Cancelled)

6. (Cancelled)

7. (Cancelled)

8. (Amended) A method for the production of a coal-based cellular product comprising a matrix of cells having ~~integral stiffeners or load paths, directed heat transfer paths and/or directed mass transfer paths defined in or about said matrix by~~ cells of a different density ~~or of a different size said method~~, comprising:

~~A)~~ selecting ~~as the matrix material~~ a first coal-based precursor ground to a particle size below about 1mm ~~which matrix material will, upon expansion,~~ for ~~provide~~ providing a matrix of an appropriate strength and density;

~~B)~~ selecting a second coal-based precursor ground to a particle size below about 1mm, ~~but of a~~ having a different particle size than that of said matrix, said second coal-based precursor when expanded providing at least one of ~~the required~~ an integral stiffener, ~~or~~ a load paths, a heat transfer paths~~, and/or~~ and a mass transfer paths;

~~C)~~ loading each of said ~~selected~~ first and second coal-based precursors into ~~each of at least two predefined~~ first and second volumes of a mold, wherein first and second coal-based precursors are separated by ~~appropriate partition(s)~~ partitions within the mold ~~to define said matrix of said first coal-based precursor having said integral stiffeners or load paths, directed heat transfer paths and/or mass transfer paths defined by said second coal-based precursor in or about said matrix~~;

~~D)~~ heating said mold under a non-oxidizing atmosphere to a temperature ~~of between~~ ranging from about 300°C ~~and~~ to about 700°C and soaking at this temperature for a period of from about 10 minutes to about 12 hours; and

~~E)~~ controllably cooling said coal-based product.

9. (Amended) The method for the production of a coal-based cellular product comprising a matrix of cells having cells of a different density of claim 8, wherein said partitions are removed prior to ~~initiation of~~ said heating.

10. (Amended) The method for the production of a coal-based cellular product comprising a matrix of cells having cells of a different density of claim 8, wherein said partitions remain in place during said heating and are either integrated into the coal-based product ~~or vaporized~~.

11. (Amended) The method for the production of a coal-based cellular product comprising a matrix of cells having cells of a different density of claim 8, wherein said mold comprises glass or ceramic.

12. (Cancelled)

13. (Cancelled)

14. (New) A coal-based cellular product, comprising:

a matrix of cells having a density; and

at least one of an integral stiffener, load path, direct heat transfer path, and a mass transfer path coal-based cells arranged in said matrix of cells defined by the presence of coal-based cells having a different density and cell size than said cells of the matrix.

15. (New) The coal-based cellular product of claim 14, wherein said coal-based cellular product is formed from bituminous coal.

16. (New) The coal-based cellular product of claim 15, wherein said bituminous coal has a swell index of from about 3 to about 5.

17. (New) The coal-based cellular product of claim 16, wherein said bituminous coal has a Gieseler plasticity value above about 500 DDPM.

18. (New) The coal-based cellular product of claim 14, wherein said coal-based cells have a greater wall thickness than said matrix cells.

19. (New) The coal-based cellular product of claim 14, wherein said coal-based cells have a greater heat conduction then said matrix cells.

20. (New) The coal-based cellular product of claim 14, wherein said coal-based cellular product is a heat exchanger material.

21. (New) The coal-based cellular product of claim 14, wherein said coal-based cells have different mass transfer characteristics than said matrix cells.

22. (New) A method for forming a coal-based cellular product having a matrix of cells of different densities, comprising:

arranging a coal-based precursor having particle sizes below about 1mm into a mold;

arranging said mold into a pressure chamber under a non-oxidizing atmosphere;

heating said thermally conductive mold to a temperature ranging from about 300°C to about 700°C and holding at this temperature for about 10 minutes to about 12 hours; and

controllably cooling said coal-based product for forming a coal-based product having a matrix of cells different densities.

23. (New) The method for forming a coal-based cellular product having a matrix of cells of different densities of claim 22, wherein said mold is thermally conductive and includes at least one of aluminum and steel.

24. (New) The method for forming a coal-based cellular product having a matrix of cells of different densities of claim 22, wherein said matrix of cells have a linearly graded structure.

25. (New) The method for forming a coal-based cellular product having a matrix of cells of different densities of claim 22, wherein said coal-based precursor includes a

high volatile bituminous coal and a load low volatile bituminous coal for forming a matrix of cells have a graded cellular structure.

26. (New) The method for forming a coal-based cellular product having a matrix of cells of different densities of claim 25, further comprises:

separating said high volatile bituminous coal and said low volatile bituminous coal inside the mold with a removable partition.

27. (New) The method for forming a coal-based cellular product having a matrix of cells of different densities of claim 28, further comprises:

vibrating the mold to achieve a predetermined packing density of the high volatile bituminous coal and low volatile bituminous coal.

28. (New) The method for forming a coal-based cellular product having a matrix of cells of different densities of claim 28, wherein said inert atmosphere comprises nitrogen at a pressure ranging from of about 25 to about 500 psi.